

# **GAZOS CREEK WATERSHED RIPARIAN VEGETATION SURVEY**

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## **Gazos Creek Riparian Vegetation Survey**

Conducted for the:  
Gazos Creek Watershed Assessment and Enhancement Plan

### Methods

Several indices of vegetation health were assessed during the field reconnaissance portion of the Vegetation Survey:

- 1) Canopy cover - absence or presence
- 2) Dominant type - tree, shrub, herbaceous ground cover
- 3) Density - as a percentage
- 4) Community type - e.g., alder/willow riparian forest, coast redwood/tanoak riparian forest
- 5) Invasive non-native species

Following the review of aerial photographs, maps and other relevant documents, a field survey was conducted to document and field check the information contained in the documents.

Sixteen survey points along the length of Gazos Creek and its tributaries were sampled. Only those areas where written access agreements were obtained were assessed.

Within the riparian area, generally described as 150' on either side of the center of the channel, transect sample plots of a 50-meter radius were established, flagged, and mapped. All information was recorded on project data forms. Between transects, any sites where degraded areas, invasive plant species or species of concern were observed were noted and their locations recorded. Other randomly selected sites were selected to sample beginning at an area of good access or obvious change in vegetation; this was accomplished by entering the creek and stopping every 100'.

### Protocols

The assessment of canopy cover and density utilized the U.S. Forest Service standardized releve protocol and the California State Fish and Game Rapid Bioassessment protocol. Within the established transect, 50-meter plot lines were measured. At 10-meter intervals recordings were made of individual species, community type, height, percentage of cover (using Spherical Densiometer), and relative density (Brower/Zar/von Ende). Within the channel, the presence or absence of overhanging vegetation types were noted. Any species of concern and communities of concern will be noted (Jepson, Manual of the

Flowering Plants of California, Thomas, Flora of the Santa Cruz Mountains of California). Any non-native invasive species were recorded (Bossard, et. al. Invasive Plants of California's Wildlands).

### Results

A review of aerial maps and archival materials indicated that no significant changes in vegetation have occurred in the riparian area during the last 30 years. Prior to that time, significant upslope areas were logged and skid roads left in place. The field surveys indicate invasive weedy species have occupied and continue to occupy disturbed areas, primarily plantains, periwinkle, broom and pampas grasses. These species are present on bare ground where slips have occurred or roads are still in place, as well as along the shoulders of currently used roads.

#### Primary plant communities

Within the riparian corridor five primary plant communities are present with many transitional patterns: 1) From the upstream end of the lagoon to one half mile upstream 1/2 mile poison oak is dominant from the water's edge to the top of the streambank and upland. There is no tree canopy within this stretch of the riparian area; 2) Upstream of the single residence, the plant community becomes more diverse and is dominated by Central Coast Riparian Scrub (scrub oak, willow, and California bay with a mixed understory of poison oak and blackberry); 3) From approximately Road Mile 1.3 to Site K (approximately road mile 3), a red alder riparian and mixed evergreen forest is dominated by live oak, alder and buckeye with a sparse understory of shrubby plants, primarily red elderberry, poison oak, ferns and blackberry. At Old Woman's Creek, red alder riparian forest persists but the community reflects some of the continued human presence with plum trees, Himalayan blackberries and European grasses as well as vinca and forget-me-not. 4) From Site K up through the Mountain Camp area, the red alder riparian corridor is dominated by 40' to 60' alder, mature oak, redwood and Douglas fir trees, sparse undergrowth, and shrubby vegetation. Continually moist stream banks are occupied by several species of fern and rushes.

#### Canopy Cover

Sixteen locations were sampled with a 50' radius from a randomly selected central point within the riparian corridor. This method indicates that the average cover within the corridor ranges from a low of 16% to a high of 98% with the mean being 64%. There are few areas within the corridor that are without cover but these are rare occurrences. Bank undercuts with overhanging rootwads and shrubs provide cover and shade in most places where no large trees are present. The stream banks provide other vegetation such as fern, elk-clover, and thimbleberry.

#### Density

Tree density indicates that downstream of Old Woman's Creek Bridge most sites are occupied by trees of 6' or less DBH (diameter breast height) and the density ranged from 32 to 40 trees per 1,000 square ft. Upstream of Old Woman's Creek Bridge the trees are more mature and of larger species such as oak and Douglas fir. The DBH averaged 8 – 14" and the density was considerably less ranging from 18 to 30 trees per 1,000 sq.ft. In and around the Mountain Camp area the density increases to 40-50 trees of 12" DBH per 1,000 sq.ft. with some specimens measuring 18 – 26" DBH.

### Invasive Species

Although the Gazos Creek watershed is relatively undeveloped and uninhabited, it has a wide diversity of invasive plant species. Distribution vectors are wind, water, roadways, and human intervention. Although it is possible that birds and mammals are also carrying seed spores, most of the invasives are grouped and easily tracked. The most common invasives found in the watershed are listed below:

- *Hypericum canariensis*, a member of the St. Johnswort family is abundant from Gazos Creek road both south and north to the area at the top of the west-facing slope of the hill facing Hwy 1. A graduate student at San Jose City College is studying this plant.
- *Cortaderia jubata* (pampas grass) is evident in all draws from the beach inland and in scattered upslope areas. Becoming more evident along the Gazos Creek road right-of-way from Hwy 1 to Cloverdale Road with scattered sparse occurrences along the road shoulders.
- *Vinca major* (periwinkle) is also evident beginning in the area just east of Hwy 1 along the Gazos Creek Road right-of way and occupies areas up to 200' in diameter in some places. There are heavy occurrences approximately 1.0 miles inland, 500' upstream of Old Woman's Creek Bridge and at Slate Creek.
- *Cytisus scoparius* (Scotch boom). Although there are sporadic areas of growth along side the road, the majority appears in dense patches up stream of Gazos Creek Road at Slate Creek and on the inboard side of the road at Site U.
- *Mentha pulegium* (pennyroyal) has recently become evident in the ditch areas along Cloverdale Road from the intersection with Gazos Creek Road north approximately 2.0 miles. This is a highly invasive species and will spread through the waters in the ditch into Gazos Creek very quickly.
- *Myosotis latifolia* (forget-me-not) abounds throughout the disturbed areas where there is no native ground cover. It can also be found on sandbars in mid-stream and along the riparian corridor in areas without native cover.
- *Plantago coronopus* (plantain) occurs along the disturbed roadside areas and is considered a pioneer plant.

Table 1. Plant species observed within Gazos Creek watershed riparian zone

CODE	SCIENTIFIC NAME	COMMON NAME	NATIVE	NONNATIVE INVASIVE	Species of Concern
ACMA	<i>Acer macrophyllum</i>	bigleaf maple	x		
AECA	<i>Aesculus californicus</i>	California buckeye	x		
AGAP	<i>Agoseris apargioides</i>	seaside dandelion		x	
ALRU	<i>Alnus rubra</i>	red alder	x		
AQFO	<i>Aquilegia formosa</i>	northwest crimson columbine	x		
BLSP	<i>Blechnum spicant</i>	deer fern	x		
CIIN	<i>Cichorium intybus</i>	european chicory		x	
CLSI	<i>Claytonia sibirica</i>	candyflower	x		
COCA	<i>Corylus californica</i>	hazlenut	x		
CYFR	<i>Cystopteris fragilis</i>	brittle fern	x		
DECA	<i>Dentaria californica</i> v <i>integrifolia</i>	coast milkmaids	x		
DIFO	<i>Dicentra formosa</i>	western bleeding heart			x
EQTE	<i>Equisetum telmateia</i> ssp. <i>.braunii</i>	horse tail	x		
HYCA	<i>Hypericum Canariense</i>			x	
IRLO	<i>Iris longipetala</i>	coast iris	x		
LOHI	<i>Lonicera hispidula</i>	hairy honeysuckle	x		
MIGU	<i>Mimulus guttatus</i>	common large monkey flower	x		
MAFA	<i>Marah fabaceus</i>	wild cucumber	x		
MOPE	<i>Montia perfoliata</i>	miners lettuce	x		
PLCO	<i>Plantago coronopus</i>	cut-leaved plantain		x	
PSDO	<i>Pseudotsuga menziesii</i>	Douglas fir	x		
QEWI	<i>Quercus wislizeni</i>	interior live oak	x		
QUBE	<i>Quercus dumosa</i>	California scrub oak	x		
LIDE	<i>Lithocarpus densiflora</i>	tan oak	x		
OXOR	<i>Oxalis oregana</i>	redwood sorrel	x		
ROCA	<i>Rosa californica</i>	California rose	x		
RUUR	<i>Rubus ursinus</i>	California blackberry	x		
SAL	<i>Salvia spathacea</i>	pitcher sage	x		
SACA	<i>Sambucus callicarpa</i>	Coast red elderberry	x		
SCBI	<i>Scolipus bigelovii</i>	fetid adder's tongue	x		
SCCA	<i>Scrophularia californica</i>	California bee plant	x		
SESE	<i>Sequoia sempervirens</i>	coast redwood	x		
SILA	<i>Silix lasiolepis</i>	arroyo willow	x		
POMU	<i>Polystichum munitum</i>	western sword fern	x		
RUDI	<i>Rhus diversiloba</i>	pacific poison oak	x		
UMCA	<i>Umbellularia californica</i>	California bay laurel	x		
URCA	<i>Urticaceae californica</i>	coast nettle	x		
TROV	<i>Trillium ovatum</i>	western trillium	x		
TOCA	<i>Torreya californica</i>	nutmeg	x		
QUAG	<i>Quercus agrifolia</i>	coast live oak	x		
JUPA	<i>Juncus patens</i>	common rush			
VAOV	<i>Vaccinium ovatum</i>	evergreen huckleberry	x		
ROPA	<i>Rubus parviflorus</i>	thimbleberry	x		
LOWR	<i>Lotus wrangelianus</i>	California lotus	x		
MYLA	<i>Myosotis latifolia</i>	forget-me-not		x	
CYSC	<i>Cytisus scoparius</i>	Scotch broom		x	
TODI	<i>Toxicodendron diversilobum</i>	western poison-oak	x		

Table 2. Survey point data

Date	Site I.D.	Location	Elev.	Avg. % Canopy Closure	Tree Height	Nonnative Invasives	Riparian Width		Major Slope Axis
							R Bank	L Bank	
4/25/02	GACR-001V	N Fork/Mtn Camp	600'	63%	80'	MYLA	30'	70'	NW
4/25/02	GACR-002V	S Fork/Bear Gulch	320'	79%	40 - 100'	CYSC	50'	20'	SE
4/28/02	GACR-003V	Slate Creek	240'	87%	100'+	MYLA	16'	13'	NW
4/29/02	GACR-004V	Site Q	200'	60%					
7/25/02	GACR-005	Site K	200'	85%					
7/25/02	GACR-006	Site K+100'	200'	72%					
7/25/02	GACR-007	Site K+200	200'	65%					
7/25/02	GACR-008	Site K+300	200'						
8/21/02	GACR-011V	OWC-BR	100'	90%	30'	MYLA	17'	30'	NW
8/21/02	GACR-012	OWCB+100'	100'	60%					
8/21/02	GACR-013	OWCB+200'	>100	56%	40'	MYLA			
8/21/02	GACR-014	OWCB+300'	>100	56%	25'				
8/21/02	GACR-017	OWCB+600'	>100	19%	30'	AGAP			
8/21/02	GACR-018	OWCB+700'	>100'	63%					
8/21/02	GACR-019	OWCB+800	>100'	38%					
8/21/02	GACR-020	OWCB+900	>100	52%		AGAP			

Table 3. Dominant Species Observed

Date	Site I.D.	Quadrat A - Dominant Species Observed				Quadrat B - Dominant Species Observed				Quadrat C - Dominant Species Observed				Quadrat D - Dominant Species Observed			
		Trees	Shrub	Herb	Ground	Trees	Shrub	Herb	Ground	Trees	Shrub	Herb	Ground	Trees	Shrub	Herb	Ground
4/25/02	GACR-001V	ACMA	COCA RHDH TOCA CYFR BLSP	RHDI	moss lichen MOPE Salvia	QEWI SESE			salvia RUUR moss lichen LOHI POMU		ACMA ALRU		RUUR salvia AQFO	LIDE PSDO	SICA		KUUR SLRI OXOR POMU
4/25/02	GACR-002V	ACMA PSDO QEWI UMCA QUDU	ROCA		DECA salvia POMU EQCA CLSI	PSDO		PSDO	salvia RUUR lichen moss	PSDO	RUUR ACMA EQNY SPDO	POMU	IRLO DECA	ACMA ALRU	ALRU	POMU PSDO	lichens moss salvia TODT ROCA
4/28/02	GACR-003V	LIDETA	QUAG POMU RDCE TOCA		RUUR OXOR TROV	SESE	TOCA POMU rush		OXOR RUUR mosses VAOV	QUAG SESE	TOCA POMU QUAG		OXOR mosses VAOV	LIDE ACMA	PSDO		OXOR POMU mosses VAOV
4/29/02	GACR-004V	ACMA	ALRU SEDGE EQTE POMU TOCA VAOV	ROCA EQTE			EQTE POMU TOCA										
7/25/02	GACR-005	QUDU  ALRU		LOHI RUUR  ROCA	OXOR												
7/25/02	GACR-006	QUDU ALRU	QUAG	EQTE	lichen MOPE moss												
7/25/02	GACR-007	QEWI	RHDI TOCA	LOHI	OXOR												
7/25/02	GACR-008	QIET QUDU	POMU		OXOR												

8/21/02	GACR-011V	ALRU SILA	SILA RUUR URCA	EQTE POMU CIIN	POMU	ALRU	RUUR RHDI POMU SACA	EQTE rushes	MYLA							
8/21/02	GACR-012	ALRU	RUUR POMU SACA DIFO													
8/21/02	GACR-013	POMU ALRU	MAFA													
8/21/02	GACR-014	RUUR	ALRU	sedges												
8/21/02	GACR-017		ALRU	rushes EQTE AGAP URCA SACA												
8/21/02	GACR-018		RUUR	rushes												
8/21/02	GACR-019		RUUR ALRU													
8/21/02	GACR-020		SCCA RUUR SACA	URCA EQTE AGAP	sedges PLCO grasses											